REMARKS

This responds to the Office Action mailed on April 7, 2004. Claim 18 is amended. No claims are canceled or added. As a result, claims 1,5-6, 9-12, 14-15, 17-22 and 31-33 remain pending in this application.

Information Disclosure Statement

Applicant submitted an Information Disclosure Statement and a 1449 Form on September 15, 2003. Applicant respectfully requests that an initialed copy of the 1449 Form be returned to Applicants' Representatives to indicate that the cited references have been considered by the Examiner.

§112 Rejection of the Claims

Claim 18 was rejected under 35 USC § 112, second paragraph, for indefiniteness. Applicant has amended the claim to obviate the rejection. Applicant respectfully requests withdrawal of the rejection.

§103 Rejection of the Claims

Claims 1, 5, 6, 9-12, 14, and 15 were rejected under 35 USC § 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) and Mitani et al. (U.S. Patent No. 6,191,463). Applicant respectfully traverses this rejection and requests the Examiner to consider the following.

The Examiner has the burden under 35 USC § 103 to establish a *prima facie* case of obviousness. *In re Fine*, 837 F.2d 1071, 1074, 5 U.S.P.Q.2d (BNA) 1596, 1598 (Fed. Cir. 1988). In combining prior art references to construct a *prima facie* case, the Examiner must show some objective teaching in the prior art or some knowledge generally available to one of ordinary skill in the art that would lead an individual to combine the relevant teaching of the references. *Id.* The M.P.E.P. contains explicit direction to the Examiner that agrees with the *In re Fine* court:

> To establish a prima facie case of obviousness, three base criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there

> must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. (citing *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). (M.P.E.P. § 2143 8th Ed, Rev.1).

An invention can be obvious even though the suggestion to combine prior art teachings is not found in a specific reference. *In re Oetiker*, 977 F.2d 1443, 24 U.S.P.Q.2d (BNA) 1443 (Fed. Cir. 1992). However, while it is not necessary that the cited references or prior art specifically suggest making the combination, there must be some teaching somewhere which provides the suggestion or motivation to combine prior art teachings and applies that combination to solve the same or similar problem which the claimed invention addresses. One of ordinary skill in the art will be presumed to know of any such teaching. (see, e.g., *In re Nilssen*, 851 F.2d 1401, 1403, 7 U.S.P.Q. 2d 1500, 1502 (Fed. Cir. 1988) and *In re Wood*, 599 F.2d 1032, 1037, 202 U.S.P.Q. 171, 174 (C.C.P.A. 1979)). However, the level of skill is not that of the person who is an innovator but rather that of the person who follows the conventional wisdom in the art. *Standard Oil Co. v. American Cyanamid Co.*, 774 F.2d 448, 474, 227 U.S.P.Q. 293, 298 (Fed. Cir. 1985). The requirement of a suggestion or motivation to combine references in a *prima facie* case of obviousness is emphasized in the Federal Circuit opinion, *In re Sang Su Lee*, 277F.3d 1338; 61 U.S.P.Q.2D 1430 (Fed. Cir. 2002), which indicates that the motivation must be supported by evidence in the record.

The test for obviousness under 35 USC § 103 must take into consideration the invention as a whole, which means that one must consider the particular problem solved by the combination of elements that defines the invention. *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1143, 227 U.S.P.Q. 543, 551 (Fed. Cir. 1985). The Examiner can only rely on references which are either in the same field and that of the invention, or is not in the same filed, the references must be "reasonably pertinent to the particular problem with which the inventor was concerned." *In re Oetiker*, 977 F.2d 1443, 24 U.S.P.Q.2d (BNA) 1443 at 1445 (Fed. Cir. 1992). The Examiner must also recognize and consider not only the similarities but also the critical difference between the claimed invention and the prior art. *In re Bond*, 910 F.2d 831,

834, 15 U.S.P.Q.2d (BNA) 1566, 1568 (Fed. Cir. 1990) *reh'g denied,* 1990 U.S. App. LEXIS 19971 (Fed. Cir. 1990).

If the proposed modification renders the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion of motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 U.S.P.Q. 1125 (Fed. Cir. 1984). The Examiner must also avoid hindsight. *Id.* The Examiner cannot use the Applicant's structure as a "template" and simply select elements from the references to reconstruct the claimed invention. *In re Gorman*, 933 F.2d 982, 987, 18 U.S.P.Q.2d (BNA) 1885, 1888 (Fed. Cir. 1991).

Applicant respectfully submits that the suggested combination of references of the AAPA with Mitani fails the above noted requirements at least because the cited Mitani reference is for a polysilicon gate structure over a gate dielectric and not the claimed polysilicon, barrier layer, metal layer gate stack. The portion of Mitani cited by the outstanding Office Action is directed at the problem of providing halogen for the semiconductor substrate (i.e., below the gate dielectric) having a concentration profile in the channel direction (see col. 41, line 56 top col. 42, line 3; and figures 44, 45 and 46). This is a different problem than the one solved by the present claims, which provide a "*fluorine-containing composition that is metered to the substrate and gate stack in gaseous form*" for a purpose of "*oxidizing the polysilicon layer under conditions that reduce redeposition on the substrate and the gate stack of a volatilized portion of the metal film*" as recited in claims 1 and 5. Applicant respectfully submits that there is no motivation to combine Mitani, having a halogen source with the AAPA gate stack, to solve a problem with vaporization or volatilization of a metal film—such a problem is not even addressed in Mitani. Thus, the suggested combination of references is inappropriate and uses hindsight to solve a problem not conceived of in either of the suggested references. Applicant further submits that the suggested combination of references is not "reasonably pertinent to the particular problem with which the inventor was concerned" as required as shown in the case of *In re Oetiker*, discussed above. In view of the above, Applicant respectfully requests that this rejection be withdrawn.

Claims 17-22 were rejected under 35 USC § 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) and Mitani et al., as applied to claims 1, 5, 6, 9-12, 14, and 15 above, and further in view of Cunningham (U.S. Patent No. 6,479,362). Applicant respectfully traverses this rejection.

The cited references of the AAPA and Mitani have been discussed above. Cunningham is used in the outstanding Office Action to show that the use of polysilicon sidewalls and metal nitride barrier layers in a polycide gate is known. Applicant respectfully submits that Cunningham does nothing to cure the above noted failures of the AAPA and Mitani references to provide one of ordinary skill in the art any motivation to make the suggested combination. Instead, Cunningham appears to be directed at forming self aligned contacts in DRAM type memory structures (see abstract and col. 3, lines 25-27). The gate structure of Cunningham is different from the claimed structure at least in that Cunningham has a barrier layer between the polysilicon and a silicide layer, as opposed to the claimed arrangement of "*a metal film over the barrier layer*", which arrangement has a potential situation of "*a volatilized portion of the metal film*" redepositing on the sidewalls of the gate electrode during oxidation operations. Such a problem is not discussed in Cunningham since silicide films do not exhibit this behavior, but do exhibit much larger sheet resistances than metal films. Applicant respectfully submits that the suggested combination of references does not meet the requirements for a motivation to make the suggested combination, and requests that this rejection be withdrawn.

Claims 31-33 were rejected under 35 USC § 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) and Mitani et al., as applied to claims 1, 5, 6, 9-12, 14, and 15 above, and further in view of Jain et al. (U.S. Patent No. 6,613,682). Applicant respectfully traverses this rejection.

The cited references of the AAPA and Mitani have been discussed above. The Jain reference is used in the outstanding Office Action to show that the use of halogen containing gases during gate patterning is known. Jain apparently teaches that a dielectric anti-reflective coating ("DARC") needs to be removed during gate electrode etching, due to the dielectric nature of the DARC adversely affecting device performance.

Applicant respectfully submits that Jain does not cure the failures of the suggested combination of the AAPA and Mitani, as discussed above, to provide one of ordinary skill in the art with any sort of motivation to make the suggested combination of references. Specifically, since Jain is directed toward a simplified DARC removal process that uses a halogen containing gas during the gate etching process, there is no possible suggestion to use the halogen containing gas to prevent redeposition of a volatized metal film during a gate oxidation process. Applicant respectfully submits that the suggested combination of references does not meet the requirements for a motivation to make the suggested combination, and requests that this rejection be withdrawn.

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney, David Suhl, at (508) 865-8211 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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Date October 12, 2004

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 12 day of October, 2004.

Tina Wood
Name

Signature